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MCZ newsletter

MUSEUM OF COMPARATIVE ZOOLOGY

NOTES ON AN M.C.Z. NATURALIST

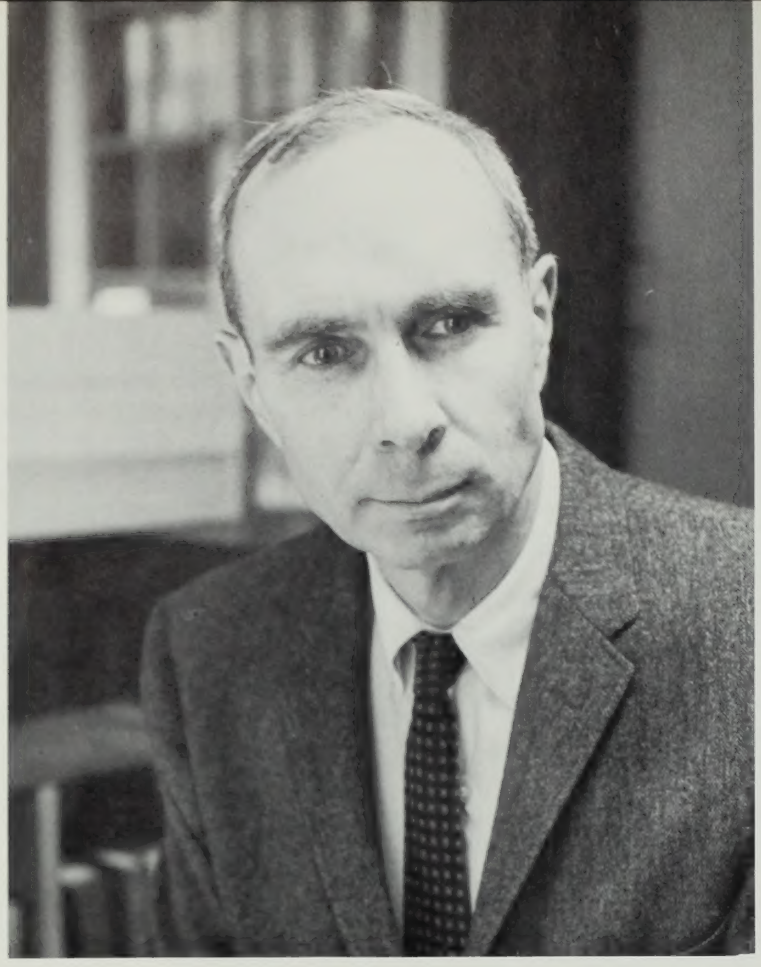
Philip Jackson Darlington, Jr., for 40 years a member of the staff of the Museum of Comparative Zoology, retired on August 31, 1971. Although he is still very much "in the thick of things" (the latest issue of *Systematic Zoology* contains an article and a book review by Darlington as well as a commentary on one of his earlier papers!), this seems an appropriate time to look back over the career of one of the MCZ's most illustrious figures.

Philip Darlington received his A.B. (1926), S.M. (1927), and Ph.D. (1931), from Harvard. When he was only 22 he spent three months at Harvard's Atkins Research Station in Cuba, and this experience so impressed him that he has returned again and again to the tropics and to remote parts of the globe. From 1928 to 1930, while still a graduate student, he was an entomologist with the United Fruit Company, and was stationed in Colombia. During this time, though his official work concerned the control of banana insects, Professor Darlington spent afternoons and holidays in collecting beetles. " . . . But [sic] after a few months an occasional hour and, more important in the tropics, a little extra energy were found for ornithological work." For ten of his fourteen months in Colombia he collected bird specimens in the Santa Marta region, Magdalena, Colombia. In his "Notes on the birds of Rio Frio (near Santa Marta), Magdalena, Colombia" Dr. Darlington tells of his bird collecting:

> Since there were many different types of habitat near Rio Frio, each with its quota of characteristic and, to me, unknown birds, I began by trying to make a census of the species. This involved collecting, for there is no book from which one may hope to recognize the majority of the local birds in the field. Many hours were spent, therefore, in stalking unknown birds . . . trying to learn their characteristics, and then collecting them. After the first few months the number of birds which it was necessary to shoot decreased steadily, while field notes increased in proportion.

His total collection in that region numbered 306 skins and included 237 species – rather a remarkable by-product of the efforts of a young man who was writing a thesis on the ground beetles of New Hampshire!

In 1932 Darlington joined the staff of the Museum of Comparative Zoology. During 1931 and 1932 he was a member of the Harvard University Expedition to Australia, under the leadership of William Morton Wheeler. The departure of this expedition led *The Boston Traveler* to devote half a page to the project, remarking that the party would "search amid tropical wildernesses for the wombat, the microscopic honey mouse . . . [and] a thousand other species of fauna little known and rare, to



Philip J. Darlington, Jr.

provide additions to the Harvard University and Australian museums . . ." Although Darlington (like Wheeler) devoted much of his energies to the collection of insects, he also took many other animals. The lizards *Lygosoma darlingtoni, Amphibolurus darlingtoni*, and the frog *Hyla darlingtoni* represented major discoveries. Of the 341 mammal specimens which he brought to the museum, 66 species were represented of which 2 were new to science, including the bat *Eptesicus darlingtoni*.

During the years 1934-1938, Darlington made several field trips to the West Indies – at that time far less accessible and far less exploited than they are now. With reference to his stay on Haiti, the *New York Times* reported that Professor Darlington climbed to the summit of Mount La Hotte, "the least known and most hazardous mountain peak in Haiti." He reached the summit in 26 days, becoming the first zoologist ever to accomplish this feat. For 15 days he was assisted by native carriers, but for four days was alone on the slopes. Darlington's customary modesty emerges as he states in an article, "It was some very good advice from Barker [a botanist who attained the summit] plus good luck in choosing the right ridge that got me up." At the top of the mountain he collected new species of flightless beetles and other insects hitherto unknown. His achievement inspired editorial comment in *The New York City American*:

> To some that will seem a dull climb, but something has been added to men's knowledge, and ten thousand years hence, men will read about that solitary mountain climb up a dangerous peak that have never heard of the charge of the Light Brigade, or even of Theodore Roosevelt going up San Juan Hill.

It would be difficult to overestimate the value of the collections Darlington made on the West Indies during those years. Several of the insects have not been collected since, and entomologists continue to mine his collections for new records and new species from areas now biologically destroyed or politically inaccessible. One by-product of his four visits to the Atkins research station in Cuba was an important paper on mimicry (1938), still cited widely in reviews of this perenially interesting subject. Some of the reptiles and amphibians he brought to the MCZ can be considered major discoveries for the West Indies, a principal area of interest to the MCZ herpetology department. These include the snake *Darlingtonia haitiana*, at least three lizards named *darlingtoni*, and the frog *Eleutherodactylus darlingtoni*. No one has compiled a list of the insects bearing this specific name – but we can be sure it would be quite a list.

Philip Darlington became Fall Curator of Coleoptera at the MCZ in 1940 and Curator of Insects in 1952. In 1942 he married Elizabeth Koch and a year later their son, Philip Frederick, was born. Professor Darlington was a tutor in Lowell House for one year (1941-1942). He then entered military service. He enlisted in the Sanitary corps of the U.S. Army and spent most of the next three years in malaria control in the Philippines and New Guinea. During this period he made several collections of Carabidae. The first originated from Dobodura, New Guinea, where he was hospitalized for several months.

> My right arm was in a cast for the first two or three months, but I had a fresh pair of heavy army pajamas (almost the equivalent of an untailored linen suit) daily, heavy army shoes, enough vials of alcohol, and an understanding hospital commander who gave me permission to come and go as I liked. I was there from March to July, 1944, long enough to cover many square miles of rain forest, swamp, and grassland. Most of my collecting was done one-handed, but practice improved that. It was during this time that I gradually learned most of the habitats of Carabidae in New Guinea.

With his characteristic reserve, Professor Darlington fails to mention that his restricted collecting technique was the result of wounds inflicted by a crocodile. According to newspaper accounts, Professor Darlington was inching his way down a log submerged in a "stagnant, foul-smelling jungle pool" in order to fill a vial with the "thick green" water. When he noticed a crocodile swimming towards him, he attempted to edge his way back to the jungle wall. He slipped from the log into the water. The newspapers recount that, "As he rose to the surface, the crocodile was upon him, mouth gaping and huge fangs bared." Professor Darlington, state the papers, tells of the horror he felt and makes the classic understatement of all time. "I was scared and I kept thinking 'What a hell of a predicament for a naturalist to be in!' " Darlington contends that these accounts are highly exaggerated. At any rate, the beast finally let go. Darlington struggled to the surface and swam to shore, climbed out of the water, slipped in the mud, and fell back in the water. Finally, he made his way from the pool and headed for the hospital.

A second collecting trip in New Guinea was made during a leave in October, 1944. By plane and jeep he reached Kundiawa, in the Bismark Range, hence by foot to the summit of Mt. Wilhelm, the highest peak on the eastern half of New Guinea.

During 1956-1958, Professor Darlington was again in Australia, this time living and traveling in a small truck with his wife and 14-year-old son. During 5 months in Tasmania, the party visited "all the important pieces of wet south-temperate rain forest within reach of a vehicle or within reasonable reach on foot." He also worked in "every important piece of wet forest" from near Melbourne to the tip of Cape York in order to study the distribution of Carabidae, particularly the transition from south temperate to tropical faunas. During this period he also provided important advice and moral support for the establishment of the Australian National Insect Collection in Canberra.

Professor Darlington's collecting technique, called "washing" or "drowning," has been very important to his realization of the vast number of species of Carabidae on the rain forest floors. He rakes up large quantities of leaf litter and loose soil and throws them into "still water where the light is good." The

debris is spread on the surface of the water and is stirred one or more times. The Carabidae hurry over the water towards shore. The collector catches them as fast as possible before they escape in flight or are eaten by birds and lizards. Thus, he explains that flash floods that wash down large masses of debris can be of immense value to a coleopterist.

In connection with his interest in distribution patterns in the Southern Hemisphere, Professor Darlington traveled to southern America for seven weeks in the winter of 1962-1963. On Tierra del Fuego he encountered "the same wind that used to keep sailing ships from rounding the Horn toward the west," necessitating a wait of nine days in Puntas Arenas. He landed at Orange Bay in a driving snowstorm on January 2 (equivalent to July 2 in the northern hemisphere). His trip to South America, combined with his earlier trips to Australia and Tasmania, enabled him to compare the faunas of "two widely separated pieces of land that are in many ways extraordinarily similar."

Professor Darlington's first major contribution to zoogeography was published in the *Quarterly Review of Biology* in 1948: "The Geographical Distribution of Cold-blooded Vertebrates." In this paper he explained that although he was an entomologist, he was convinced that insects were not well enough known and their powers of dispersal too great to provide good materials for the study of zoogeography. The fresh-water fishes, amphibians, and reptiles, he decided, provide the best insights into past and present distribution patterns, and he proceeded to compile much pertinent information on these groups.

This paper was soon expanded into a book: *Zoogeography: the Geographical Distribution of Animals* (John Wiley & Sons, 1957). G.G. Simpson hailed this book as a "fully worthy successor to the classic works of the Sclaters, Wallace, and Matthew." Simpson found it superior to all earlier discussions of the topic, "indispensable for all biologists . . . one of the outstanding books on science in recent years." For his work, Darlington was awarded the 1969 Daniel Giraud Eliot Medal of the National Academy of Sciences.

Zoogeography was followed by another book, this one focusing on some of the most intriguing problems in biology: *Biogeography of the Southern End of the World: Distribution and History of Far-southern Life and Land, with an Assessment of Continental Drift* (Harvard Univ. Press, 1965). One of the most remarkable features of both of these books is their lucidity of style. As Darlington has explained:

> I write laboriously. I have to put what I want to say in whatever words come, and then criticize and revise it over and over again, trying always to say more exactly what I mean in fewer and better words . . . I do not want to be misunderstood, not even if it is the reader's fault. I have therefore tried to use ordinary words in ordinary ways, as well as to write simply and clearly.

Coming as they did at a time when much scientific literature is almost unreadable by anyone but a dedicated specialist, these books have been especially appreciated by students and by other persons hoping to become informed on the broader issues in biology.

Dr. Darlington utilizes his collecting technique.

Recent years have also seen a steady flow of research papers on the ground beetles of Australia as well as a major review of the ground beetles of New Guinea. The last of 4 parts of the latter monograph is now in press in the *Bulletin* of the MCZ, and will include a general summary, analysis, and discussion of the New Guinea carabid fauna. Of course, Darlington has relied on much more than his own collecting in these areas. He has obtained other material by purchase or exchange and has borrowed specimens from many sources. He has built up an unparalleled collection of Carabidae, a sterling addition to the important beetle collections of LeConte, Bowditch, and Fall also housed in the MCZ.

Philip Darlington was appointed Alexander Agassiz Professor of Zoology in 1962. He has contributed to courses and given many seminars on zoogeography and has advised many graduate students. He has held two John Simon Guggenheim Fellowships, and was elected to the National Academy of Sciences in 1964. He is Fellow of the American Academy of Arts and Sciences and a member of the Society for the Study of Evolution, the Society of Systematic Zoology, and many other professional organizations.

The Darlingtons live in Belmont. Despite their wide experience in remote parts of the globe, they remain very much attached to their native haunts. Mrs. Darlington is active in the Massachusetts Audubon Society and has edited and made many contributions to their journal, *The Curious Naturalist*. Her special hobby is edible wild plants, and she and her husband are often seen roaming the hills and swamps looking for unusual tidbits. Although officially retired, Professor Darlington is as busy as ever at home and at the museum. As he has said: "There has been no better place in the world to carry on zoogeographic studies than this Museum . . ."

NEW FOSSIL INVERTEBRATE HALL NEARS COMPLETION

This Spring marks the opening of an MCZ exhibit hall which will be of interest to both students of paleontology and the general public. Mrs. Dave A. (Carol) Campbell, exhibit preparator, and her assistant, Donald Tenney, have collaborated for almost 12 months with scientific staff members in the planning and construction of this exhibit, the new Fossil Invertebrate Hall.

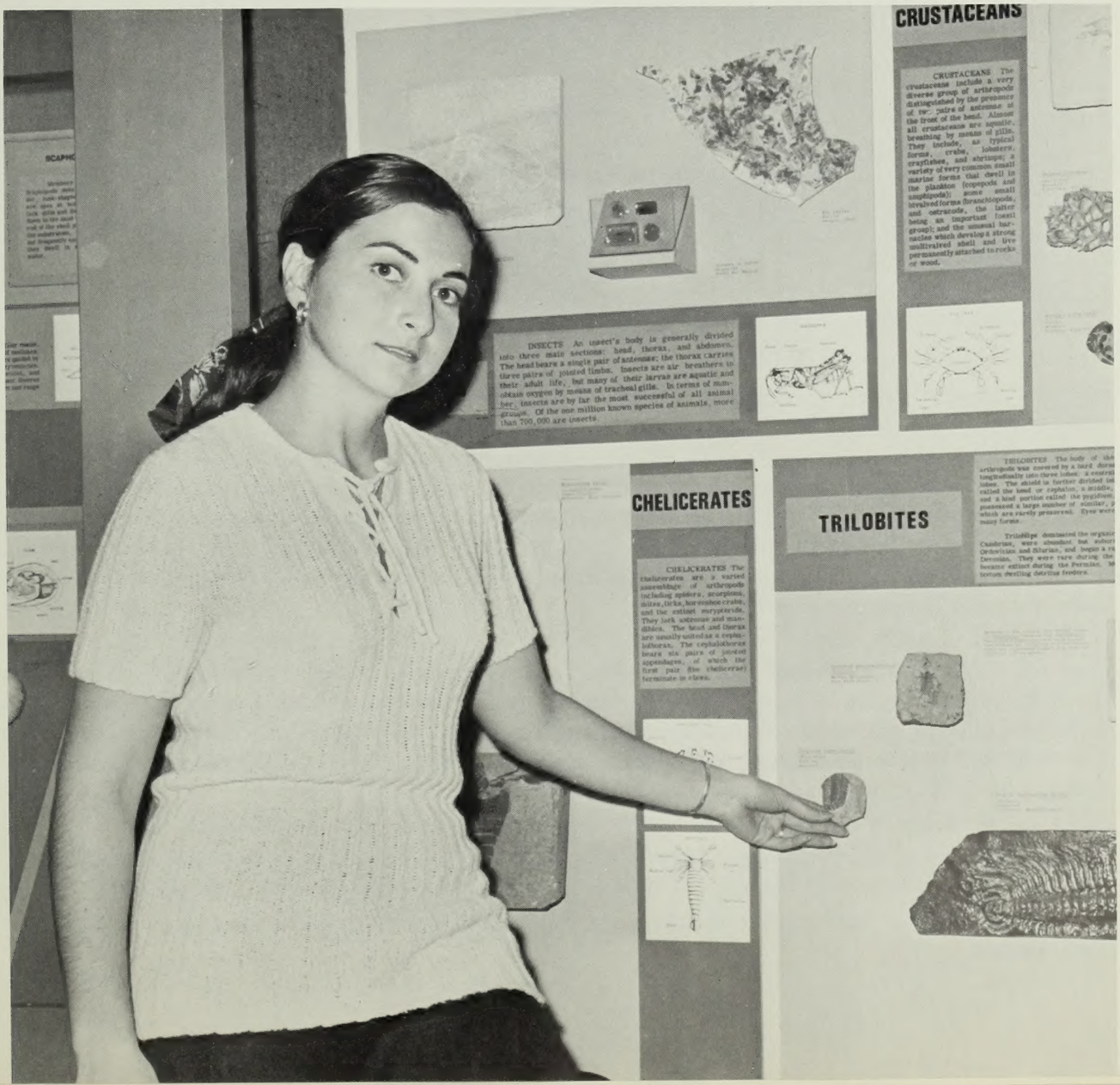
The exhibit was last renovated in 1928 under the direction of a former Curator of Fossil Invertebrates, Percy E. Raymond. Raymond's student assistant was William E. Schevill, Research Associate in Zoology. Mr. Schevill calls the earlier exhibit an "illustrated textbook," alluding to its comprehensive representation of specimens somewhat tediously mounted and labeled. Although an excellent adjunct to teaching, the exhibit had to be dismantled in the effort to increase space for offices in the Invertebrate Paleontology Department.

The exhibit is now located in the area formerly occupied by the sea mammal collection. The new hall retains its instructive aspects while adding an aesthetically pleasing dimension in the use of new

Mrs. Campbell explains a new Fossil Invertebrate display.

materials. Mrs. Campbell has given special attention to the design of the new fossil cases. Colorful backgrounds in oranges, raspberries, purples, greens and tans highlight the displays. The use of incandescent and fluorescent recessed lighting, fiberglass backings and mounts, and plexiglass label coverings increases visual comprehension of the fossil groups. Finally, the wall-to-wall carpeting, which Mrs. Campbell plans for the hall, will diminish noise and add to the warmth and unity of the exhibit.

Several exotic fossils are featured in the new hall, notably the largest nautiloid and ammonoid yet discovered. The nautiloid stands approximately ten feet tall, while the ammonoid measures about three feet in diameter and one foot thick. In addition, the exhibit includes a case donated in 1963 by Mrs. Edith Reid Stetson in memory of her late husband, Henry C. Stetson, Harvard marine geologist. The diorama is a portrayal of the sea-floor near Cincinnati nearly 450 million years ago. It includes models of extinct animals that are relatives of present-day marine invertebrates.



INVERTEBRATE PALEONTOLOGY HOSTS FRIENDS

The Friends of the MCZ will be treated to a preview of the new Fossil Invertebrate Hall at a cocktail party on November 30th. Although the hall is not yet completed, the Friends will view the progress made in the development and preparation of Museum exhibits. To highlight the evening, Dr. Steven J. Gould, Associate Professor of Invertebrate Paleontology, and a group of students will introduce the Friends to the department and discuss their work.

Among the students who will speak are Stanley Awramik and Dan Fischer, both Ph.D. candidates. Stan Awramik's research concentrates on the Precambrian fossil record and evolutionary events prior to the rise of multi-cellular animals and plants. The Precambrian encompasses geologic history prior to 600 million years. This era spans a period of 2,500 million years.

Generally speaking, the Precambrian record of life consists of microscopic fossil blue-green algae and large macroscopic structures called stromatolites. Stromatolites are organo-sedimentary features built by sediment trapping and binding action of blue-green algae. Until 1,000 million years ago, blue-green algae (prokaryotes; i.e., without a nucleus) were the most advanced form of life that had evolved. About 1,000 million years ago, the first eukaryote (nucleated) single cell organism evolved. This development of a nucleus was the greatest evolutionary event in the history of life.

Stan has been concentrating his research activities on the relationship of blue-green algae to stromatolites. He is interested in how the evolution and diversification of blue-green algae affected the structure of stromatolites. In addition, Stan has recently been investigating the effects that the appearance of eukaryotes, their rapid evolution and diversification, had on the fossil record of blue-green algae and stromatolites.

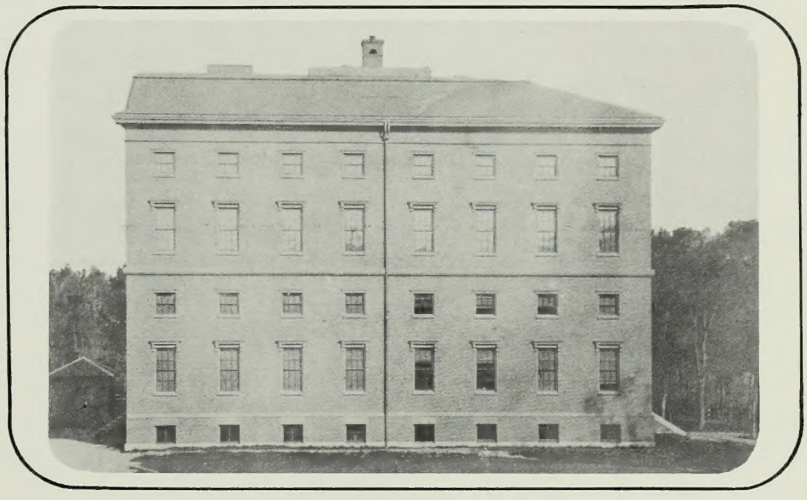
Dan Fischer's interest in the horseshoe crab developed during his undergraduate senior thesis work. His study has expanded into a definitive analysis of the morphological evolution of the horseshoe crab, generally considered to be a "living fossil." However, Dan's research indicates that the notion of this animal's conservation in form is erroneous. He points to a comparison of the horseshoe crab in the Jurassic and in the present as evidence.

Dan feels that, in the Jurassic (ca. 130 million years ago), this animal was a fresh-brackish water dweller and an efficient swimmer. In contrast, the modern horseshoe crab is a marine animal. This transition in environments has led to subtle changes in form. The modern relative seems to be more a burrower than a swimmer, and a predator of burrowing molluscs and worms. Thus, morphological changes are seen as adaptations in form to a changing environment.

The last meeting of the Friends was held on October 13th at the Concord Field Station, where Dr. C. Richard Taylor, Director of the Station, and a group of the staff members introduced their research with discussions and demonstrations. Luncheon was served, after which everyone was invited to tour the facilities.

M.C.Z. HISTORY CULMINATES IN NEW ADDITION

In the mid-1840's, Louis Agassiz arrived at Harvard from Europe and immediately began to collect marine invertebrate, ichthyological, and paleontological specimens. It soon became his intention to persuade Harvard to house the collection in a museum. However, a lack of interest, space, and finances made his task a formidable one. He began with an attempt to convince Harvard College and New Englanders of the importance of building an American museum to serve as a center of research and teaching which would rival the famed Jardin des Plantes in Paris. His academic ability was soon recognized, and he was appointed Professor of Zoology and Geology in the Lawrence Scientific School of Harvard. His first step into Harvard College had been achieved.

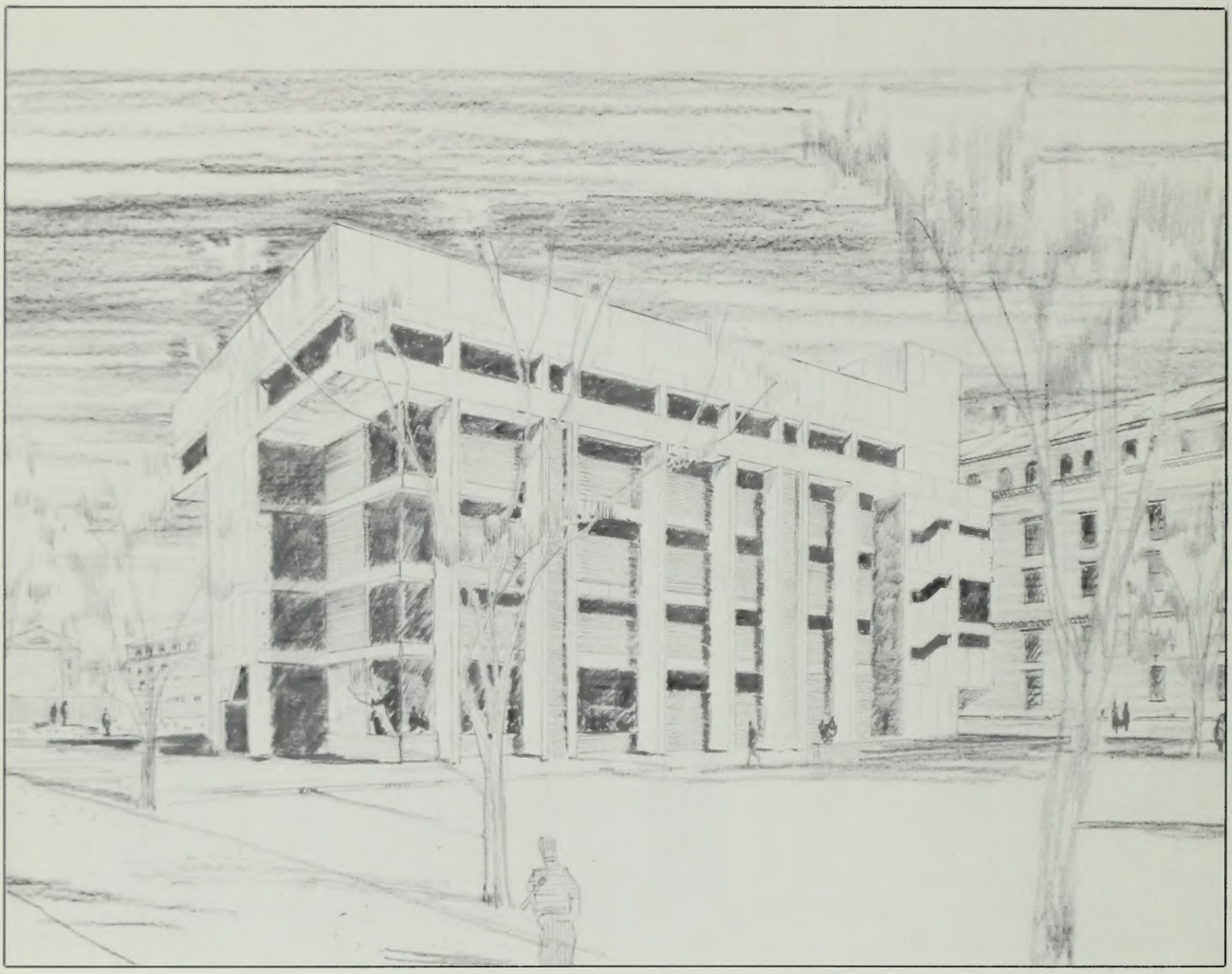


The original M.C.Z. (1860).

He then appealed to the President of Harvard, Edward Everett, to provide space to house his collection which was so important in the teaching of geology and zoology. In 1848 the University complied by purchasing an unused bath-house on the Charles River. However, the collection grew so rapidly that in 1850 it spilled over into the second floor of the Engineer Hall, a wooden structure built by funds from a Lawrence donation. In addition, two annual sums of $400 were provided from the income of the Gore bequest to Harvard College and from a private donor, John Amory Lowell, to maintain and enlarge the collection. However, Louis Agassiz consistently overspent these sums in increasing the size of the collection, which was now becoming world famous. In 1852, a few short years after his arrival in America, Louis Agassiz achieved his first ambition. Samuel Atkins Eliot, the treasurer of Harvard, collected enough money through private solicitation to purchase the collection for Harvard. In his work, *The Founding of the Museum of Comparative Zoology*, Edward Lurie called the purchase "a vital event in the realization of the museum idea." Alexander Agassiz wrote:

> Then began what has been a most unique system of scientific financiering, and one which Professor Agassiz carried on as long as he lived. Each sum obtained was merely the lever by which an additional and usually a larger sum was secured. Those of us who can look back to the early days will remember the disappointment at delays which so frequently seemed to make an end of his hopes of greater progress. His energy and enthusiasm were unbounded.

Up to this time, the collection was a part of the Department of Zoology and Geology; it was yet to be housed in a museum. In 1854, Agassiz requested that the university found such a Museum, to be independent of other academic departments. But the university refused. His academic brilliance was



Architect's sketch of the M.C.Z. addition.

now recognized throughout the world, and in 1857 he was offered "the Chair of Paleontology at the Jardin, a professorship at the Collège de France, and a newly created post as Director of the entire Museum of Natural History" (*The Founding of the Museum of Comparative Zoology*, Lurie). This marked the turning point in the creation of the Museum.

Francis Calley Gray, a friend and admirer of Agassiz, had left a sum of $50,000 for the establishment of a Museum of Comparative Zoology, to be independent of any academic department and to be sited at any university in America. This money was to be used solely for the building of collections; other resources had to be found to house and care for the collections. Harvard appears to have been reluctant to provide such moneys, and it seemed possible that some other American university would benefit from Gray's bequest. Agassiz thought otherwise. In order to build the Museum and cover its maintenance, Agassiz took the unheard-of step of soliciting the Massachusetts Legislature: it contributed $100,000! He then raised $71,000 through private and university contributions. And with this money, what is now the east portion of the North wing was built. The five story building contained five rooms to a floor. George Russell Agassiz stated, "Thus was housed (the collection) of

the first of the large University Museums of the New World." By the early 1900's the last section of the present museum had been completed with a series of additions made possible by private contributions and University funds.

The functions of the museum now not only include the housing, care, and research of collections, but also research into the activities, in the most general sense of the word, of animals during their lives.

Construction on the new wing was begun in 1971. The purpose of this building is to provide additional space for existing and new appointments in the research and teaching of environmental biology. Further, this re-allocation of space will indirectly provide additional facilities for collections housed in the present Museum. In 1969, Ernst Mayr, during his term as Director of the Museum of Comparative Zoology, stated the need for building a new wing:

> Now, more than ever, accelerated research in the natural sciences is essential in order for man to better understand himself, his relations to his fragile environment, the laws governing the biology of populations, and more broadly, the enormous diversity and complexity of the world in which he lives. For students who want to prepare themselves for a professional life dedicated to the solution of these problems, improved facilities must be made available.

With his immense energy and dedication to research and teaching in the Museum, Dr. Mayr raised $2,000,000 of which $625,000 was given by the National Science Foundation, $500,000 by the Alexander Agassiz Bequest, and $900,000 from "various generous friends of the M.C.Z. through the Program for Science at Harvard College."

The volume of correspondence in the M.C.Z. files attests to the enormous time and energy spent by Professor Mayr in his efforts to obtain the money necessary to finance the new building.

Since the time of these initial and major allocations, the Davis Foundation has contributed to the project and the Stone family has generously pledged financial support. However, the M.C.Z. still lacks $300,000 for completion of this building.

I wish to express my thanks to all of the persons who helped in the production of this Newsletter, and particularly, to Howard E. Evans, Jeffrey W. Osborn, and Frank M. Carpenter. I regret not being able to use all of the information which I have received from so many helpful people. However, it will be incorporated into future Newsletters.

(Mrs.) Hedy Mattson, *Editor*

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